XTRAMUS

DApps-NIC
User's Manual

Preliminary

USM Ver 1.0

Foreword

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Revision History

Date	USM Version	History
2012/07/17	1.0	First Draft Version

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1. DApps-NIC Overview

DApps-NIC is a software that allows NuDOG series to perform simulation of Network Interface Card (NIC). Through DApps-NIC, the network traffic status is showed based on Tx/Rx, CRC error, alignment error, dribble bit, packet size statistics, layer 2 packet counters and network layer conditions. Besides, the DApps-NIC also provides tool to upgrade your NuDOG series' FPGA and License.

Devices Supporting DApps-NIC		
NuDOG-301C	**NuDOG-801**	**NuDOG-101T**

Also, please make sure that your PC meets the requirements listed in the table down below before installing DApps-NIC.

OS	Windows 2000/XP	Windows Vista/7
CPU	Pentium 1.6 GHz or higher	
RAM	1.0GB RAM	1.5GB RAM
HDD	10GB of available hard disk space	

＊Note: Large amount of data will be generated while running DApps-NIC. It is recommended to preserve enough available Hard-Disk space to store these data.

Please see the sections down below for detailed information regarding to **NuDOG-301C**, **NuDOG-801**, and **NuDOG-101T**.

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2. NuDOG-301C Descriptions

2.1. NuDOG-301C Overview

NuDOG-301C is a handheld device with two Gigabit ports for Ethernet testing. The main functions of NuDOG-301C include multi-streams generation, TAP/Loopback test, and NIC emulation.

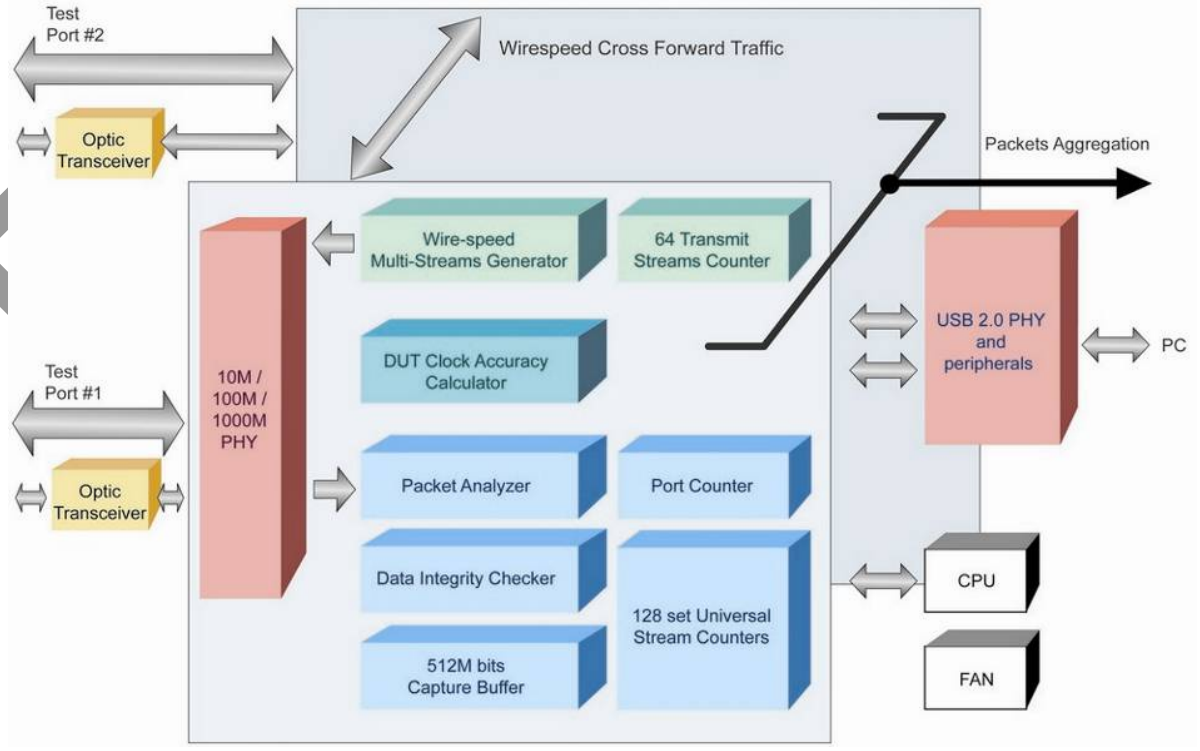
Connecting NuDOG-301C to its mini-USB port makes it possible for system configurations and managements. NuDOG-301C is an ideal device for in-field testing.

NuDOG-301C can work along with a series of utility software that qualify industrial standards such as RFC-2889, RFC-2544, and QoS. With these utilities, NuDOG-301C is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. Utility software can provide a user-friendly interface for different test configurations when setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-301C offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-301C is your best partner for LAB researching and in-field troubleshooting.

NuDOG-301C block diagram



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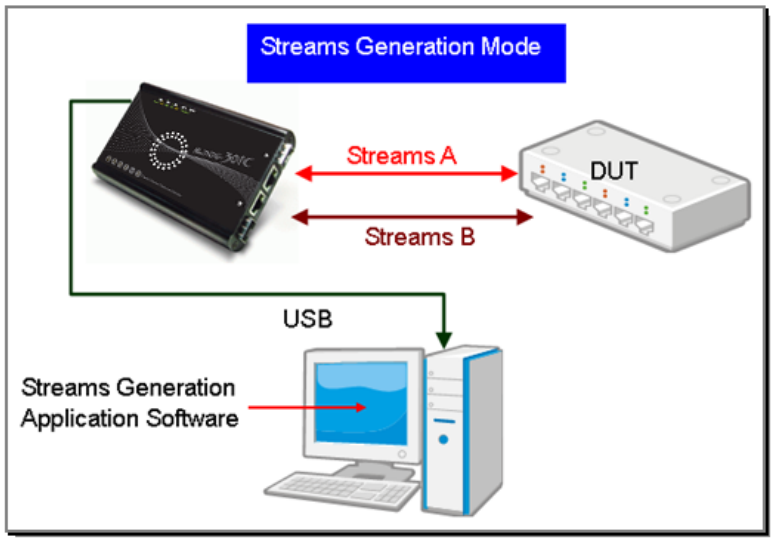
2.2. Features & Advantages of NuDOG-301C

- Hardware based wirespeed streams generation, analysis, network TAP and NIC
- High precision performance for measuring throughput, latency, packet loss and disordered sequence
- Wirespeed traffic capturing with programmable filter and trigger criteria
- Supports Universal Stream Counter (USC) with 128 streams
- RFC 2544 test suite
- RFC 2889 test suite
- Layer 1 and Layer 2 loopback test
- High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests
- Adding errors in transmitted traffic to simulate and test abnormal situations
- Real-time statistics for each port, including transmitted/received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames
- Utility software with user-friendly interface that supports various parameter configurations and meets various test requirements
- 512Mbits wirespeed packet capture buffer per port

2.3. NuDOG-301C Applications in Different Modes

Stream Generation Mode



In Streams Generation mode, NuDOG-301C generates bi-directional network streams for test requirements as the illustration above.

Both NuDOG-301C's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-301C for DUT (device under test) analysis.

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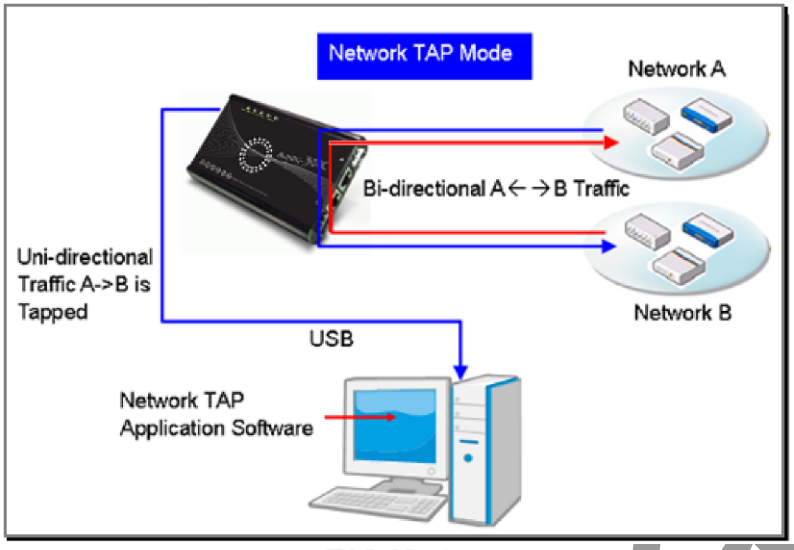
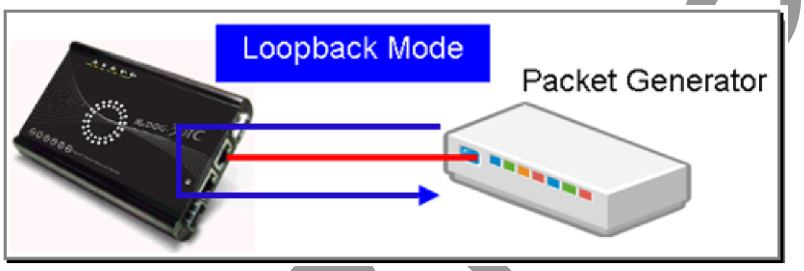
TAP/Loopback Mode



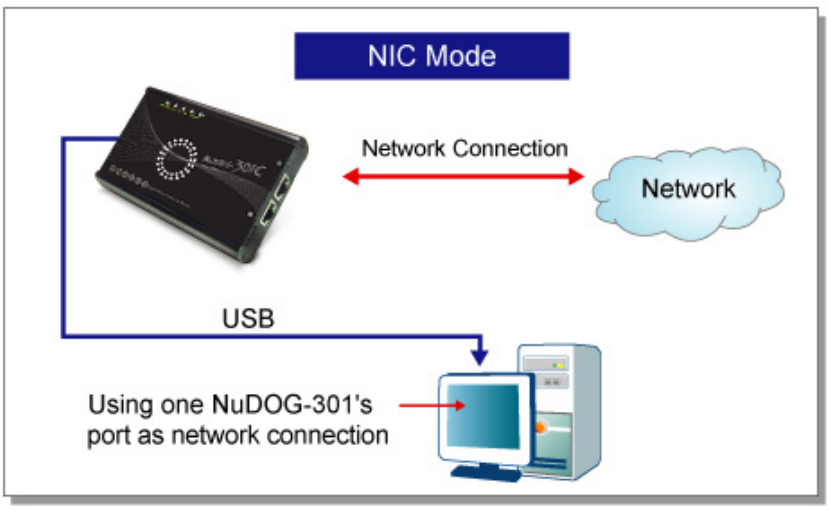
TAP Mode



Loopback Mode

In TAP mode, NuDOG-301C can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-301C can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-301C resends the incoming streams back to the source.

NIC Mode



In this mode, NuDOG-301C simulates network interface card (NIC).

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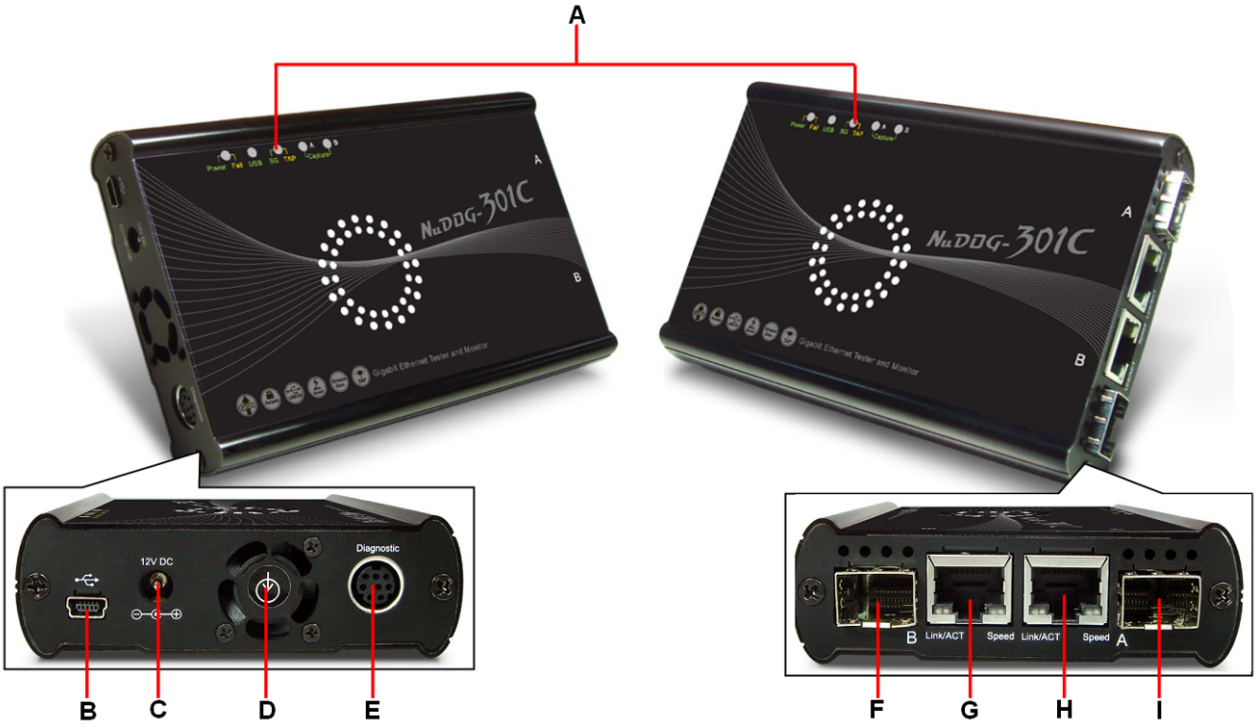
2.4. NuDOG-301C Interface Ports



NuDOG-301C Hardware Overview			
A	**LEDs**	LEDs that displays NuDOG-301C's status.	
B	**Mini-USB Port***	5 Pin Mini-B Receptacle USB Port. You can manage, configure, or update firmware/FPGA when connecting NuDOG-301C to your PC. While under TAP mode, this mini-USB port can also re-direct tapped packets to PC.	
C	**Power Jack**	12V DC Power Jack for connecting external power adapter.	
D	**Cooling FAN**	Fan hole with internal fan for ventilation.	
E	**Diagnostic Port**	8-Pin Mini-DIN Receptacle Diagnostic Port	
F	**Port B - SFP Port**	1000 Mbps Full Duplex SFP Port B	Only one port can be used at the same time.
G	**Port B - RJ45 Port**	10/100/1000 Mbps Half/Full RJ45 Port B	
H	**Port A - SFP Port**	1000 Mbps Full Duplex SFP Port A	Only one port can be used at the same time.
I	**Port A - RJ45 Port**	10/100/1000 Mbps Half/Full RJ45 Port A	

***Please note that when connecting NuDOG-301C with PC via its USB port, DO NOT use a USB hub**

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2.5. NuDOG-301C LED Status

LED	Status	Description
Power/Fail	Green Blinking	Power is ON and working properly
	Yellow Blinking	System failed
USB	Green Blinking	USB of this device is linked to PC
SG/TAP	Green	NuDOG-301C is working under Stream Generation Mode
	Yellow	NuDOG-301C is working under TAP Mode
	OFF	NuDOG-301C is working under NIC (Network Interface Card) mode
Capture A/B	Green	Port A/B is under Capturing Mode
Link/ACT	Green ON	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-301C is transmitting or receiving data
Speed	Green ON	1000Mbps connection
	Green Blinking	100Mbps connection
	OFF	10Mbps connection if Link/ACT is ON or blinking

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3. NuDOG-801 Descriptions

3.1. NuDOG-801 OVERVIEW

NuDOG-801 is a handheld device with two 10 Gigabit SFP+ Ports for Ethernet testing. The main functions of NuDOG-801 include multi-streams generation and NIC emulation.

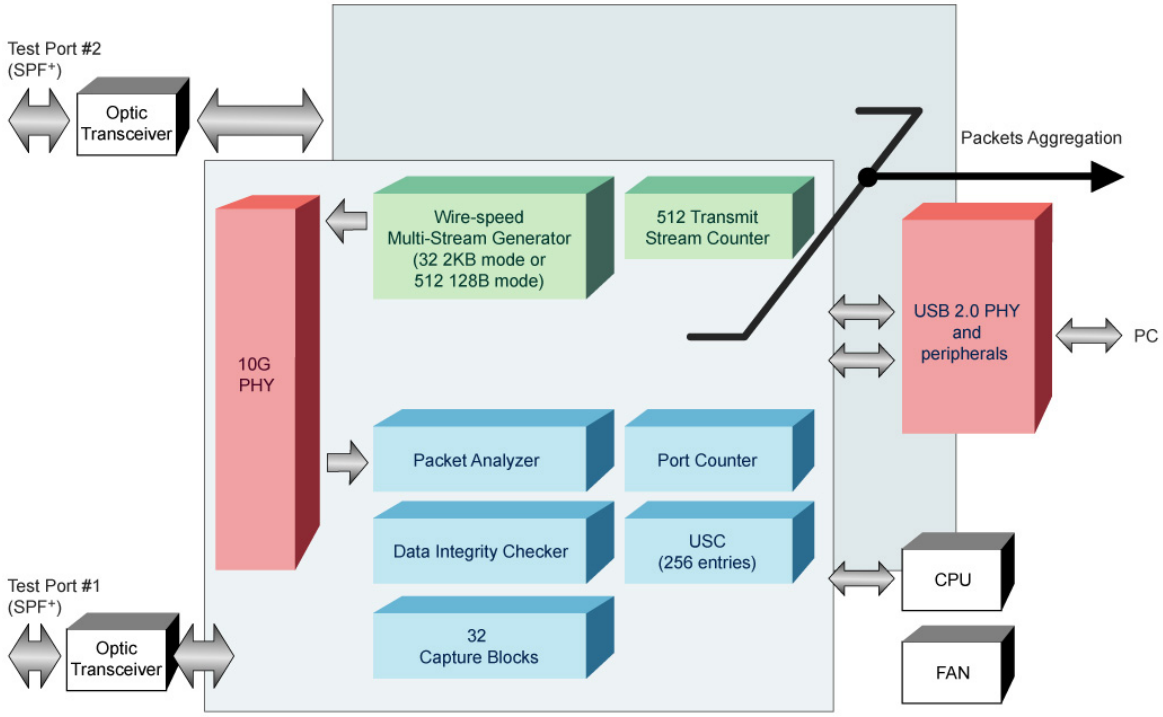
Connecting NuDOG-801 to its Standard-B Receptacle USB Port makes it possible for system configurations and managements. NuDOG-801 is an ideal device for in-field testing.

NuDOG-801 can work along with a series of utility software that qualify industrial standards such as RFC 2889, RFC 2544, and QoS. With these utilities, NuDOG-801 is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. Xtramus' utility software provides a user-friendly interface for different test configurations when setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-801 offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-801 is your best partner for LAB researching and in-field troubleshooting.

NuDOG-801C block diagram

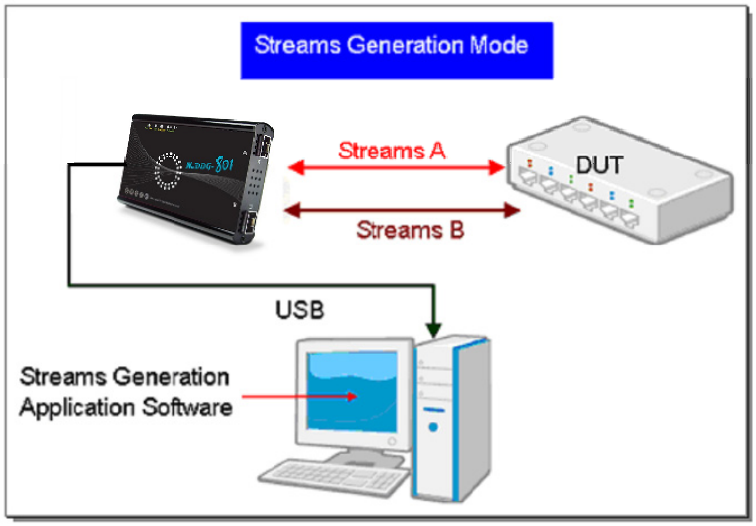


3.2. Features & Advantages of NuDOG-801

- Hardware based wirespeed streams generation, analysis, and NIC
- High precision performance for measuring throughput, latency, packet loss and disordered sequence
- Wirespeed traffic capturing with programmable filter and trigger criteria
- Supports Universal Stream Counter (USC) with 256 streams
- RFC 2544 test suite
- RFC 2889 test suite
- High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests
- Adding errors in transmitted traffic to simulate and test abnormal situations
- Real-time statistics for each port, including transmitted/received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames
- Supports IPv6
- Utility software with user-friendly interface that supports various parameter configurations and meets various test requirements
- 32 Capture Blocks for each Test Port

3.3. NuDOG-801 Applications in Different Modes

Stream Generation Mode



In Streams Generation mode, NuDOG-801 generates bi-directional network streams for test requirements as the illustration above.

Both NuDOG-801's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-801 for DUT (device under test) analysis.

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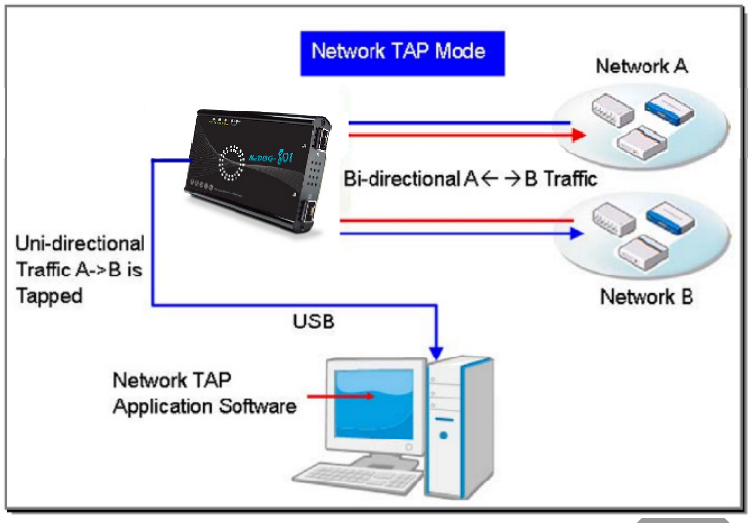
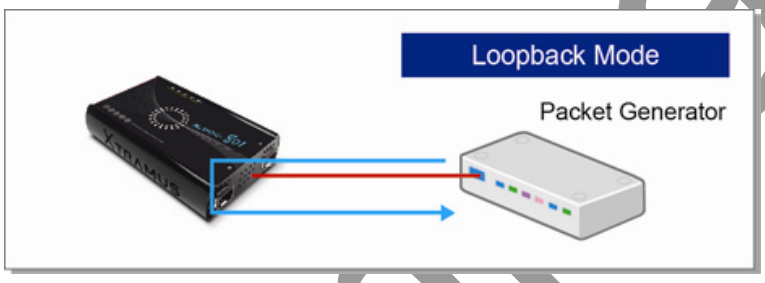
TAP/Loopback Mode



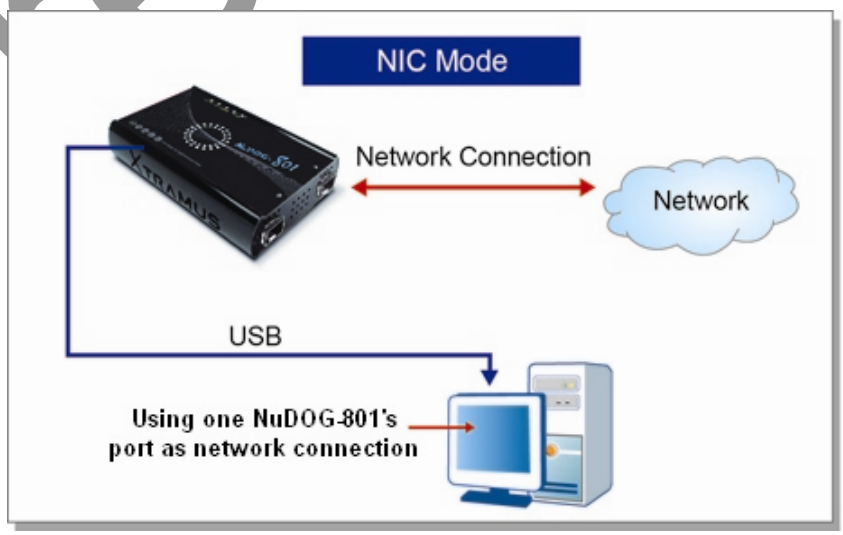
TAP Mode



Loopback Mode

In TAP mode, NuDOG-801 can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-801 can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-801 resends the incoming streams back to the source.

NIC Mode



In this mode, NuDOG-801 simulates network interface card (NIC).

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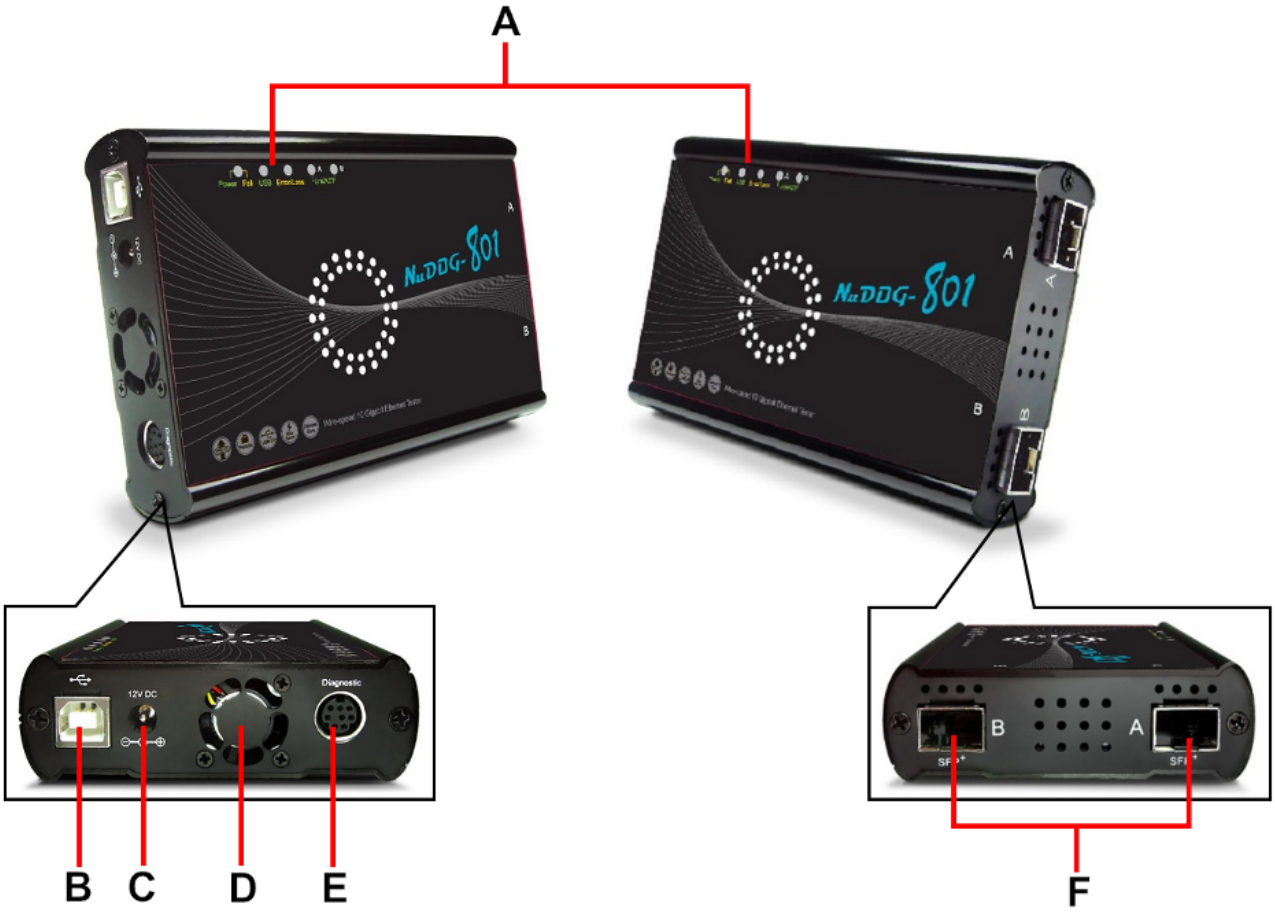
3.4. NuDOG-801 Interface Ports



NuDOG-801C Hardware Overview		
A	**LEDs**	LEDs that displays NuDOG-801C's status.
B	**Mini-USB Port***	5 Pin Mini-B Receptacle USB Port. You can manage, configure, or update firmware/FPGA when connecting NuDOG-801C to your PC. While under TAP mode, this mini-USB port can also re-direct tapped packets to PC.
C	**Power Jack**	12V DC Power Jack for connecting external power adapter.
D	**Cooling FAN**	Fan hole with internal fan for ventilation.
E	**Diagnostic Port**	8-Pin Mini-DIN Receptacle Diagnostic Port
F	**10 Gigabit Wirespeed SFP+ Port**	10 Gigabit Wirespeed SFP+ Port

***Please note that when connecting NuDOG-801C with PC via its USB port, DO NOT use a USB hub**

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3.5. NuDOG-801 LED Status

LED	Status	Description
Power/Fail	Green Blinking	Power is ON and working properly
	Yellow Blinking	System failed
USB	Green Blinking	USB of this device is linked to PC
Error/Loss	Yellow Blinking	CRC error or packet loss is occurring
	OFF	No CRC error or packet loss is occurring
Capture A/B	Green	Port A/B is under Capturing Mode
Link/ACT	Green ON	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-801 is transmitting or receiving data

Print

4. NuDOG-101T Descriptions

4.1. NuDOG-101T OVERVIEW

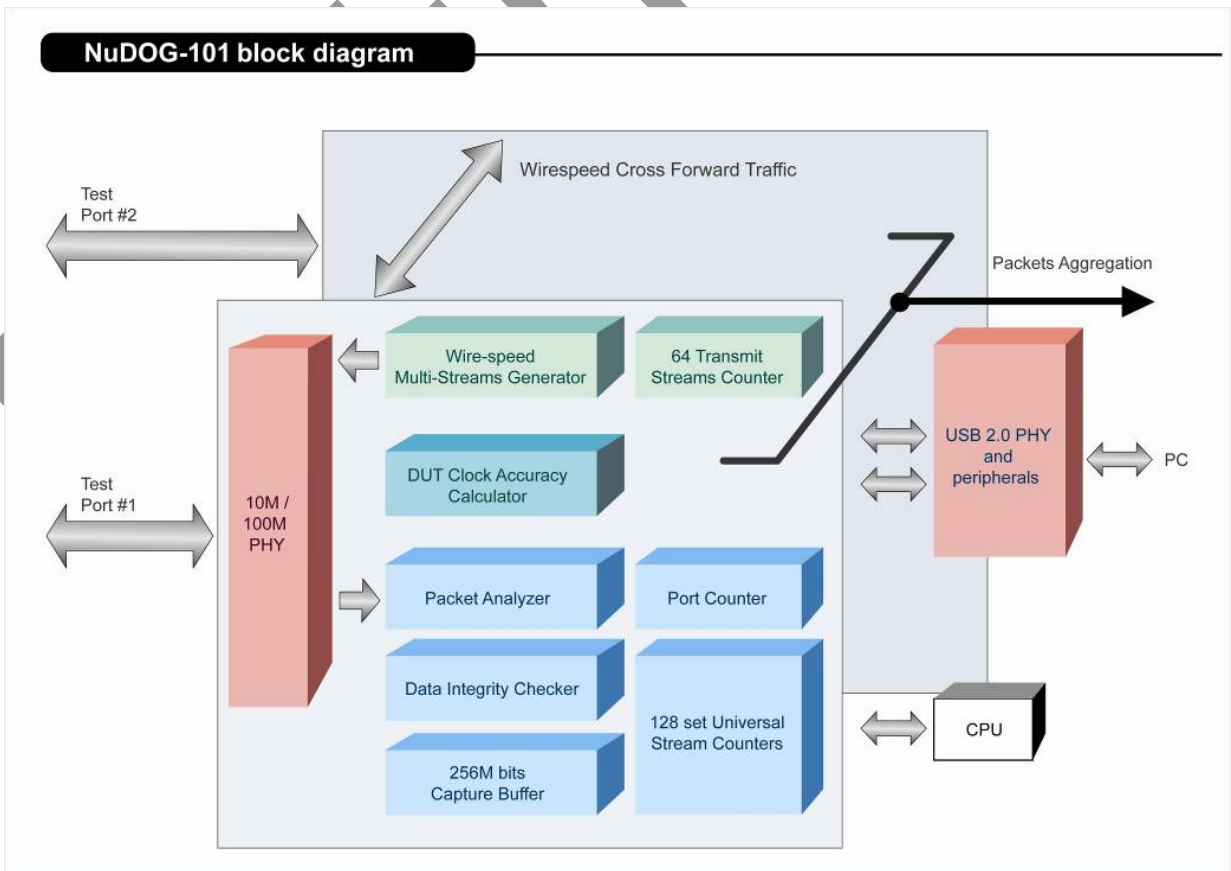
NuDOG-101T is a handheld device with two ports for Ethernet testing. The main functions of NuDOG-101T include multi-streams generation, TAP/Loopback test, and NIC emulation.

Connecting NuDOG-101T to its mini-USB port makes it possible for system configurations and managements. NuDOG-101T is an ideal device for in-field testing.

NuDOG-101T can work along with a series of utility software that qualify industrial standards such as RFC 2889, RFC 2544, and QoS. With these utilities, NuDOG-101T is able to conduct throughput test, latency test, error filtering test, forwarding test, and so on. The utility software provides a user-friendly interface for making different test configurations and setting test parameters and criteria. More optional software is available for extended test requirements.

With its unique Universal Stream Counter (USC), NuDOG-101T offers real-time statistics of network events during packet monitoring and capturing.

With these advantageous features, NuDOG-101T is your best partner for LAB researching and in-field troubleshooting.

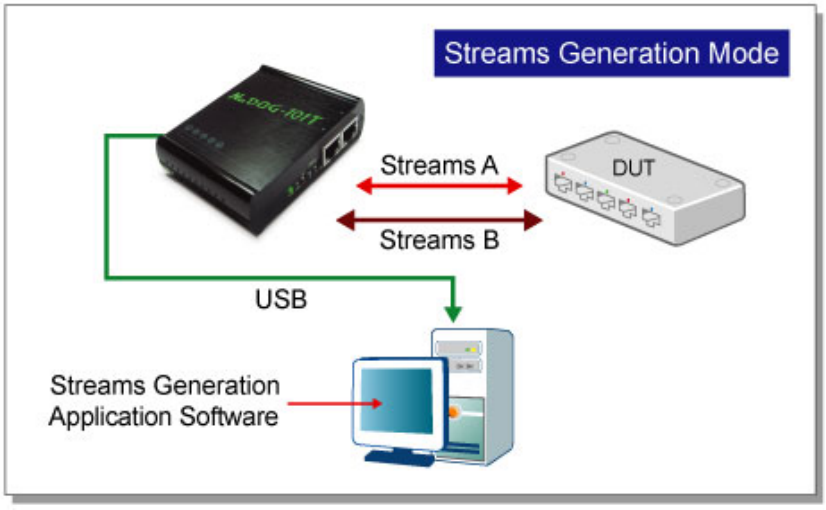


4.2. Features & Advantages of NuDOG-101T

- Hardware based wirespeed streams generation, analysis, network TAP and NIC
- High precision performance for measuring throughput, latency, packet loss and disordered sequence
- Wirespeed traffic capturing with programmable filter and trigger criteria
- Supports Universal Stream Counter (USC) with 128 streams
- RFC 2544 test suite
- RFC 2889 test suite
- Layer 1 and Layer 2 loopback test
- High precision 1 ppm temperature-compensated oscillator provides accurate clock speed to ensure the reliability of the tests
- Injecting errors in transmitted traffic to simulate and test abnormal situations
- Real-time statistics for each port, including transmitted /received frame for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error and over-and-under size frames
- User-friendly interface that supports various parameter configurations and meets various test requirements
- 256Mbits packet capture buffer per port

4.3. NuDOG-101T Applications in Different Modes

Stream Generation Mode



In Streams Generation mode, NuDOG-101T generates bi-directional network streams for test requirements as the illustration above.

Both NuDOG-101T's Port A and Port B can generate and receive test streams. The test streams are sent and returned to the same NuDOG-101T for DUT (device under test) analysis.

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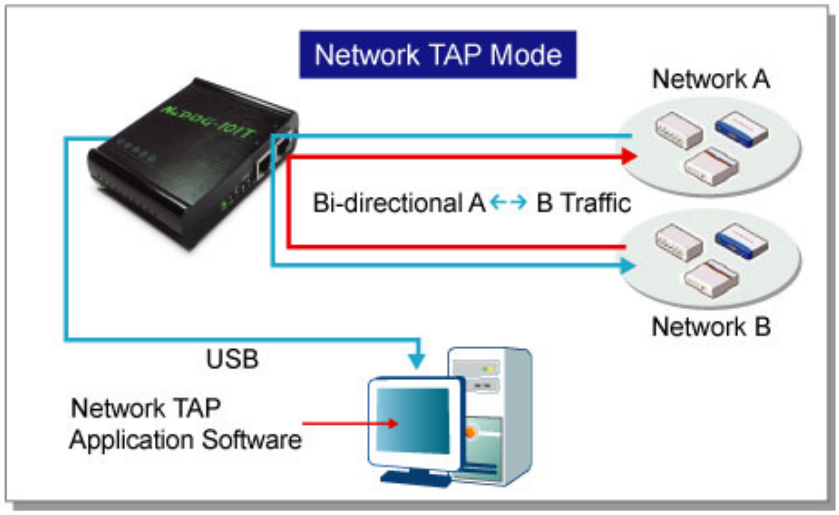
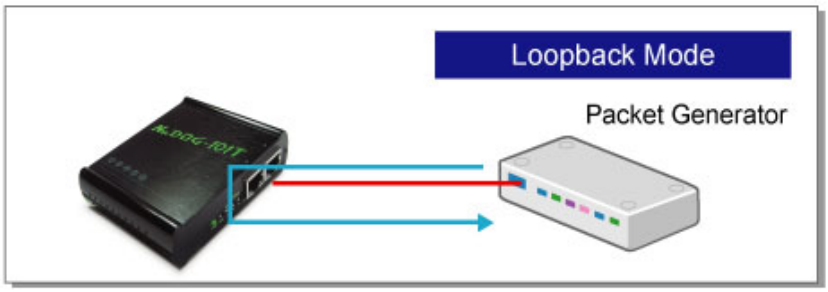
TAP/Loopback Mode



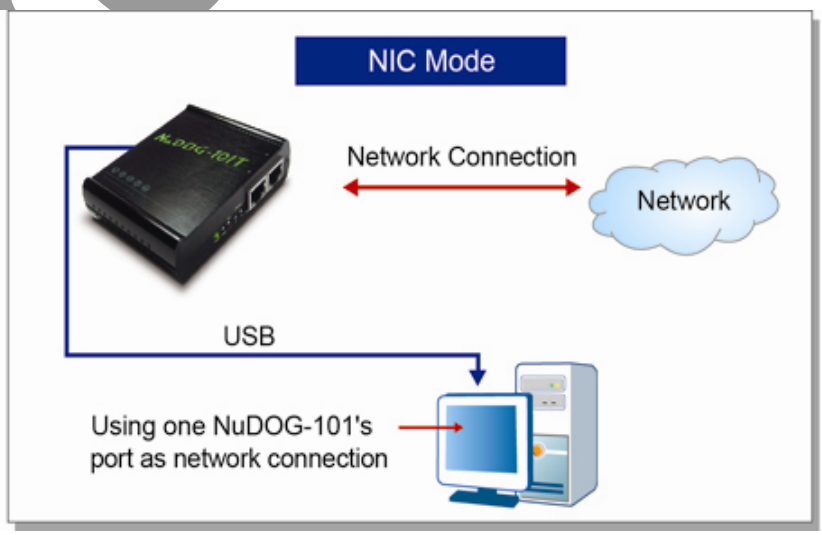
TAP Mode



Loopback Mode

In TAP mode, NuDOG-101T can monitor any data that flows through it. Network TAP is a method of monitoring network's situation dynamically without interference. NuDOG-101T can tap bi-directional or uni-directional traffic from different sides (port A and port B) and also provides abundant packet counters. In Loopback mode, NuDOG-101T resends the incoming streams back to the source.

NIC Mode



In this mode, NuDOG-101T simulates network interface card (NIC).

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4.4. NuDOG-101T Interface Ports

NuDOG-101T Hardware Overview	
A	Mini-USB Port for connecting NuDOG-101T to PC or for power supply.
B	LEDs that display NuDOG-101T's system status.
C	Interface Port A/B for connecting NuDOG-101T to DUT or network.

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4.5. NuDOG-101T LED Status

LED	Status	Description
Power	**Green Blinking**	Power is ON and working properly
	Yellow Blinking	System failed
USB	**Green Blinking**	USB of this device is linked to PC
PG/TAP	**Green**	NuDOG-101T is working under Packet Generation Mode
	Yellow	NuDOG-101T is working under TAP Mode
	OFF	NuDOG-101T is working under NIC (Network Interface Card) mode
Capture A/B	**Green**	Port A/B is under Capturing Mode
Link/ACT	**Green ON**	The RJ45 Port is connected to DUT/Network
	Green Blinking	NuDOG-101T is transmitting or receiving data
Speed	**Green ON**	1000Mbps connection
	Green Blinking	100Mbps connection
	OFF	10Mbps connection if Link/ACT is ON or blinking

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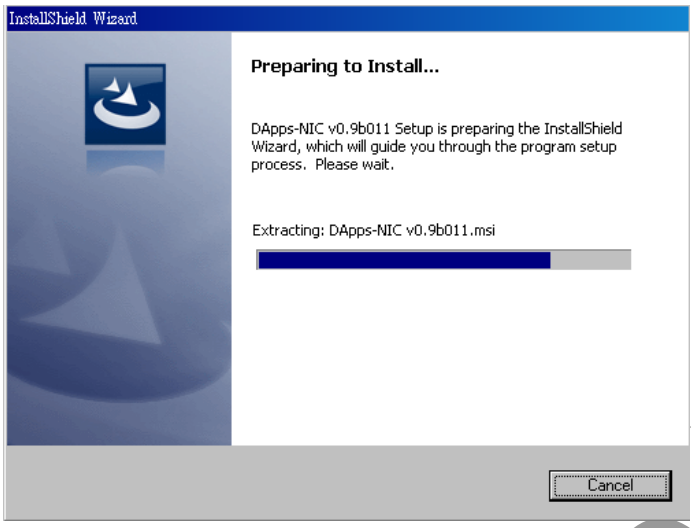
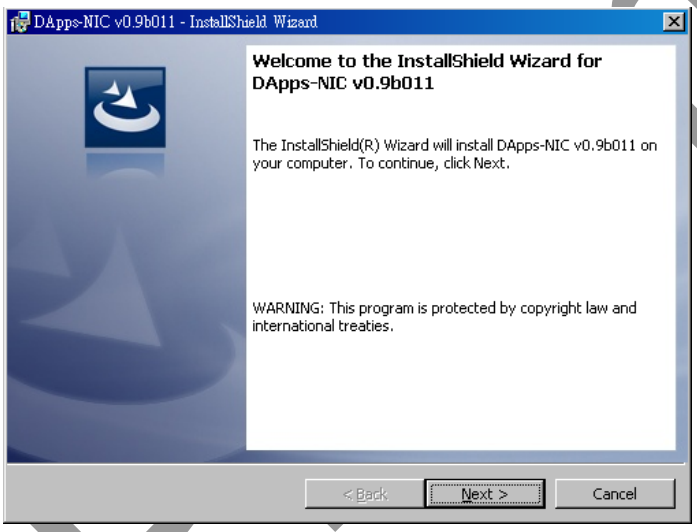
5. Software Installation and Uninstallation for DApps-NIC

Please follow the steps down below to install DApps-NIC:

Installing DApps-NIC	
	1. Double-click DApps-NIC installation program and start the installation process.
	2. InstallShield Wizard is starting to install DApps-NIC. If you would like to cancel installation, click "**Cancel**".
	3. Click "**Next**" to continue installation.

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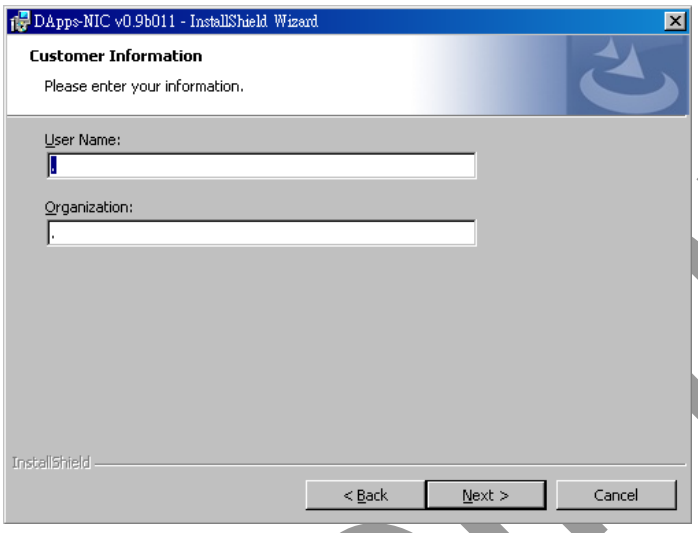
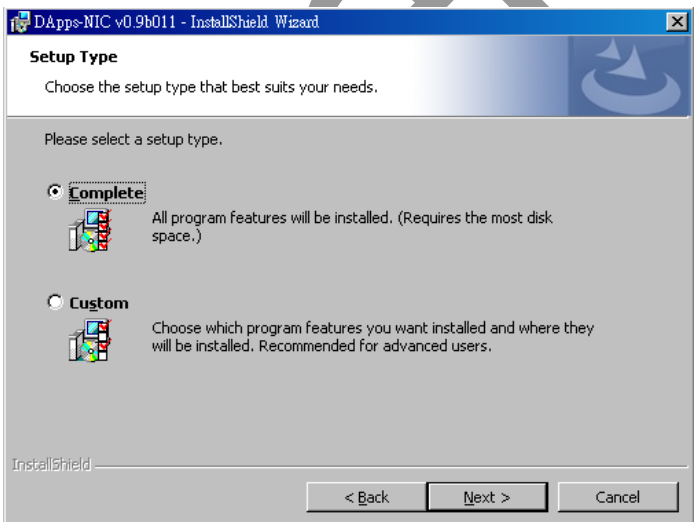
Installing DApps-NIC

DApps-NIC v0.9b011 - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
End User License Agreement
IMPORTANT NOTICE
This is a license agreement between you (either an individual or a single entity) and Xtramus Technologies ("Xtramus").
Before installing or using this software, please read the following license terms carefully. By installing or using this software, you are deemed to accept this license agreement. Do not install or use this software if you do not accept or agree with these license terms.
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

4. Click "**I accept the terms in the license agreement**", and click "**Next**" to continue.



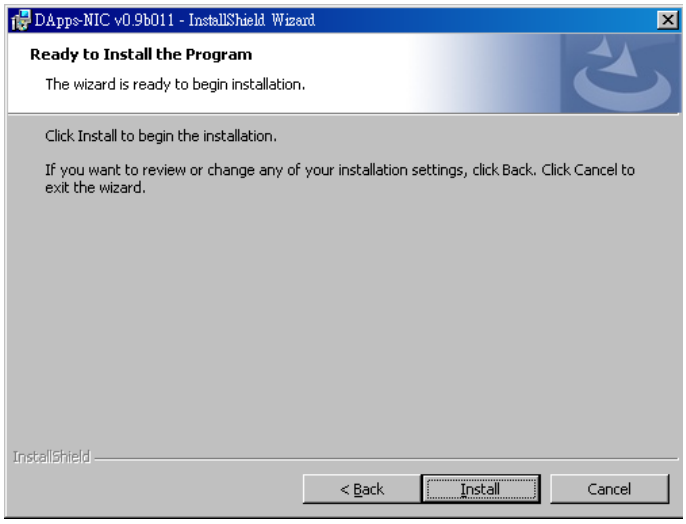
5. You can set your **User Name** and **Organization** here, and click "**Next**" to continue.


DApps-NIC v0.9b011 - InstallShield Wizard
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
All program features will be installed. (Requires the most disk space.)
Custom
Choose which program features you want installed and where they will be installed. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

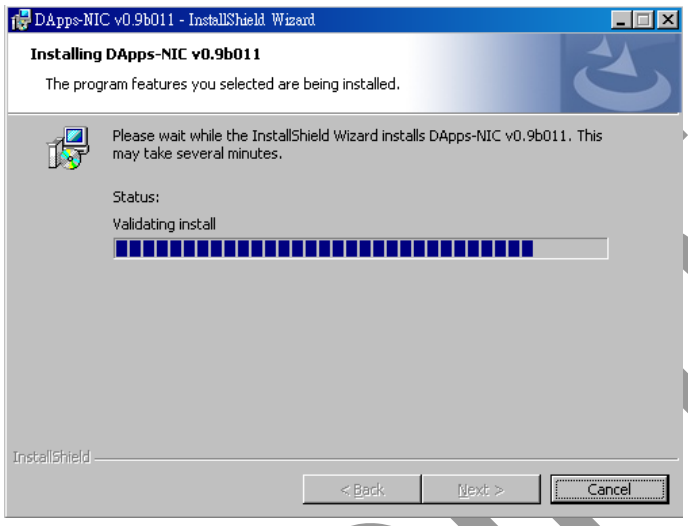
6. You can select the **Complete** option to install all program feature for running DApps-NIC, or select **Custom** option to choose the program feature to be installed.

Preliminary

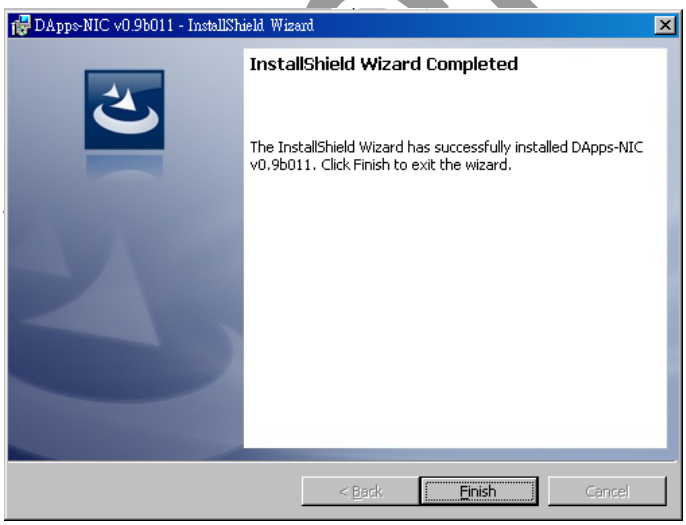
Installing DApps-NIC


DApps-NIC v0.9b011 - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

7. DApps-NIC InstallShield Wizard will start installing momentarily. Click **Install** button if the information is correct.


DApps-NIC v0.9b011 - InstallShield Wizard
Installing DApps-NIC v0.9b011
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs DApps-NIC v0.9b011. This may take several minutes.
Status:
Validating install
InstallShield
< Back
Next >
Cancel

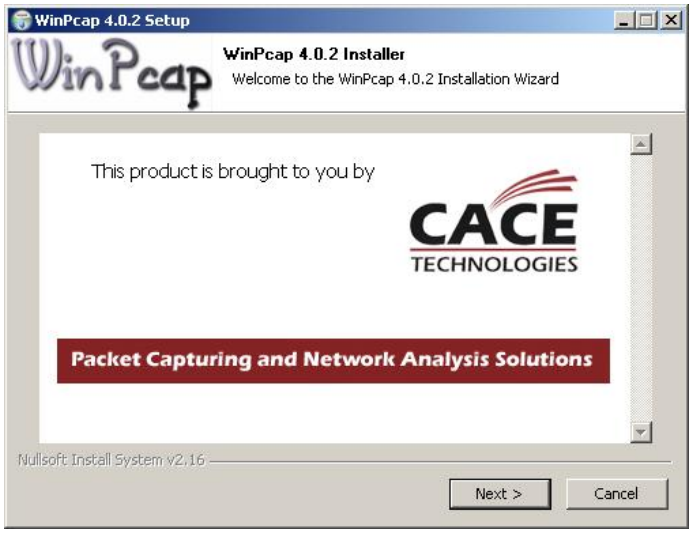
8. InstallShield Wizard is installing DApps-NIC.


DApps-NIC v0.9b011 - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed DApps-NIC v0.9b011. Click Finish to exit the wizard.
< Back
Finish
Cancel

9. DApps-NIC installation completes. Click **Finish** button to exit.

Preliminary

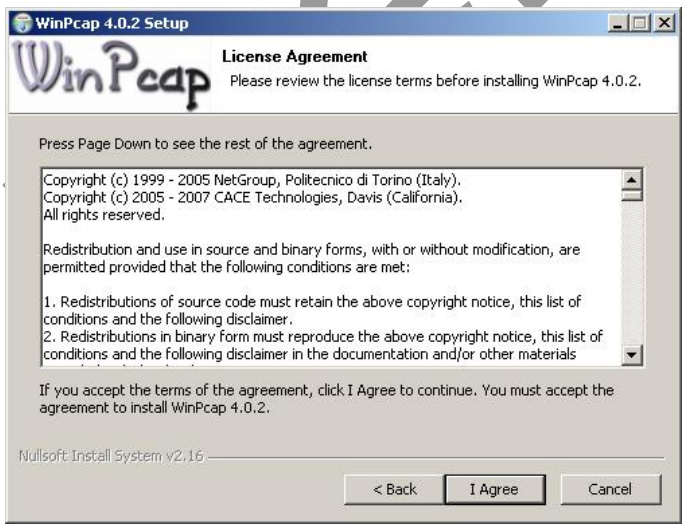
Installing DApps-NIC



10. WinPcap Installer appears. Click **Next** button to get ready to install, or click **Cancel** button to stop.

WinPcap 4.0.2 Setup
Welcome to the WinPcap 4.0.2 Setup Wizard
This Wizard will guide you through the entire WinPcap installation.
For more information or support, please visit the WinPcap home page.
http://www.winpcap.org
< Back
Next >
Cancel

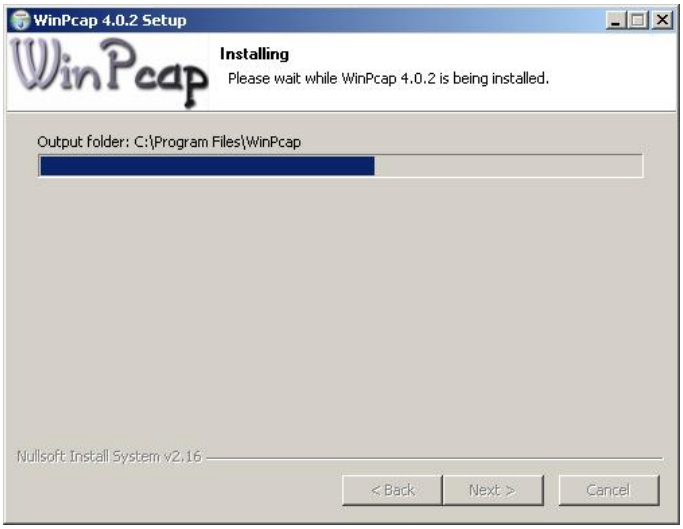
11. WinPcap is preparing to install, or click **Cancel** button to stop at any time.


WinPcap 4.0.2 Setup
License Agreement
Please review the license terms before installing WinPcap 4.0.2.
Press Page Down to see the rest of the agreement.
Copyright (c) 1999 - 2005 NetGroup, Politecnico di Torino (Italy).
Copyright (c) 2005 - 2007 CACE Technologies, Davis (California).
All rights reserved.
Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:
1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install WinPcap 4.0.2.
Nullsoft Install System v2.16
< Back
I Agree
Cancel

12. Review the license agreement before installing. Click **I Agree** button to continue. It is necessary to accept the agreement to install WinPcap.

Preliminary

Installing DApps-NIC



13. WinPcap is installing.

14. WinPcap installation completes. Click **Finish** button to close the wizard.

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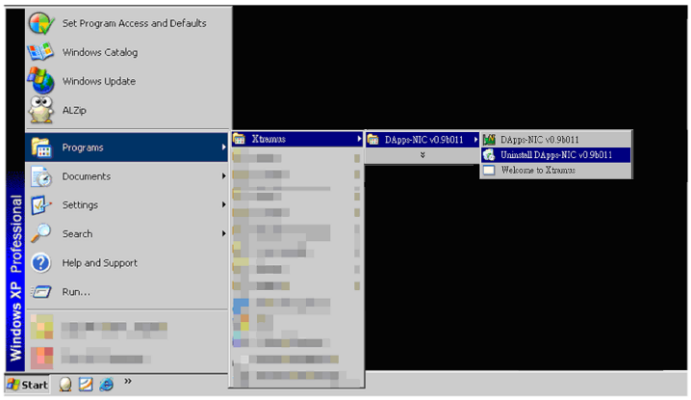
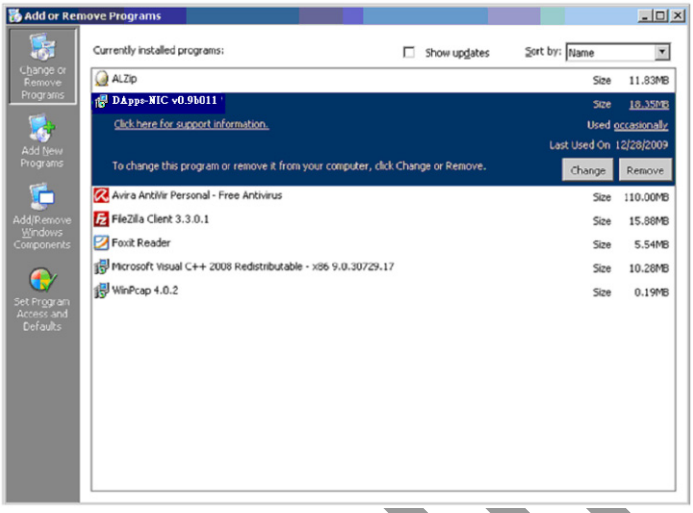
You can uninstall DApps-NIC by:



- Click Start → Programs → Xtramus → DApps-NIC → Uninstall DApps-NIC



- Go to the Control Panel, choose DApps-NIC from installed program list, and click "**Remove**" to uninstall as well.

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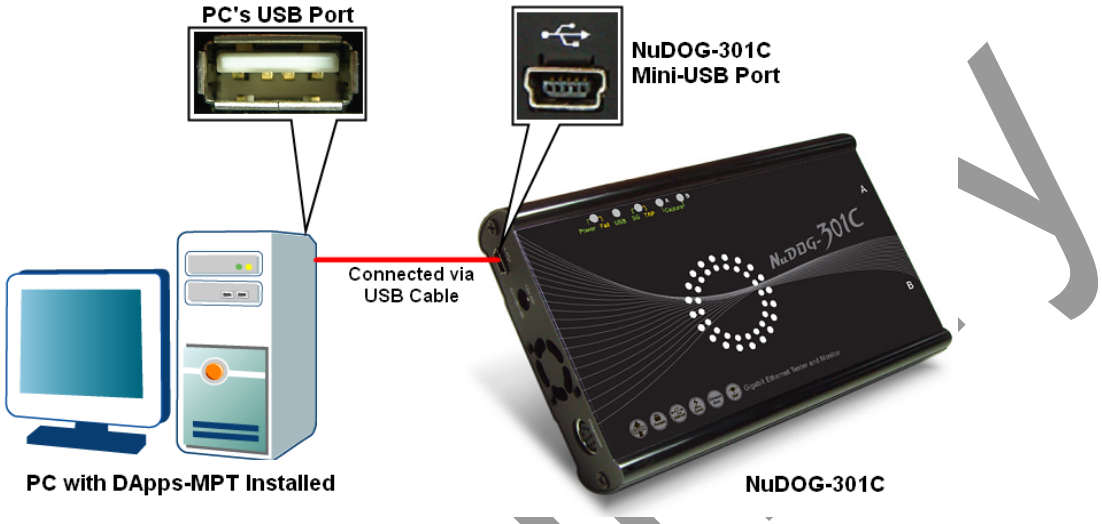
6. DApps-NIC Overview

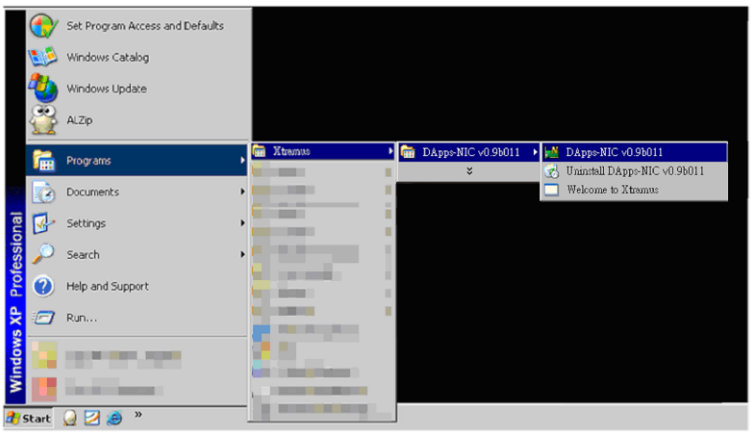
6.1. Hardware Installation

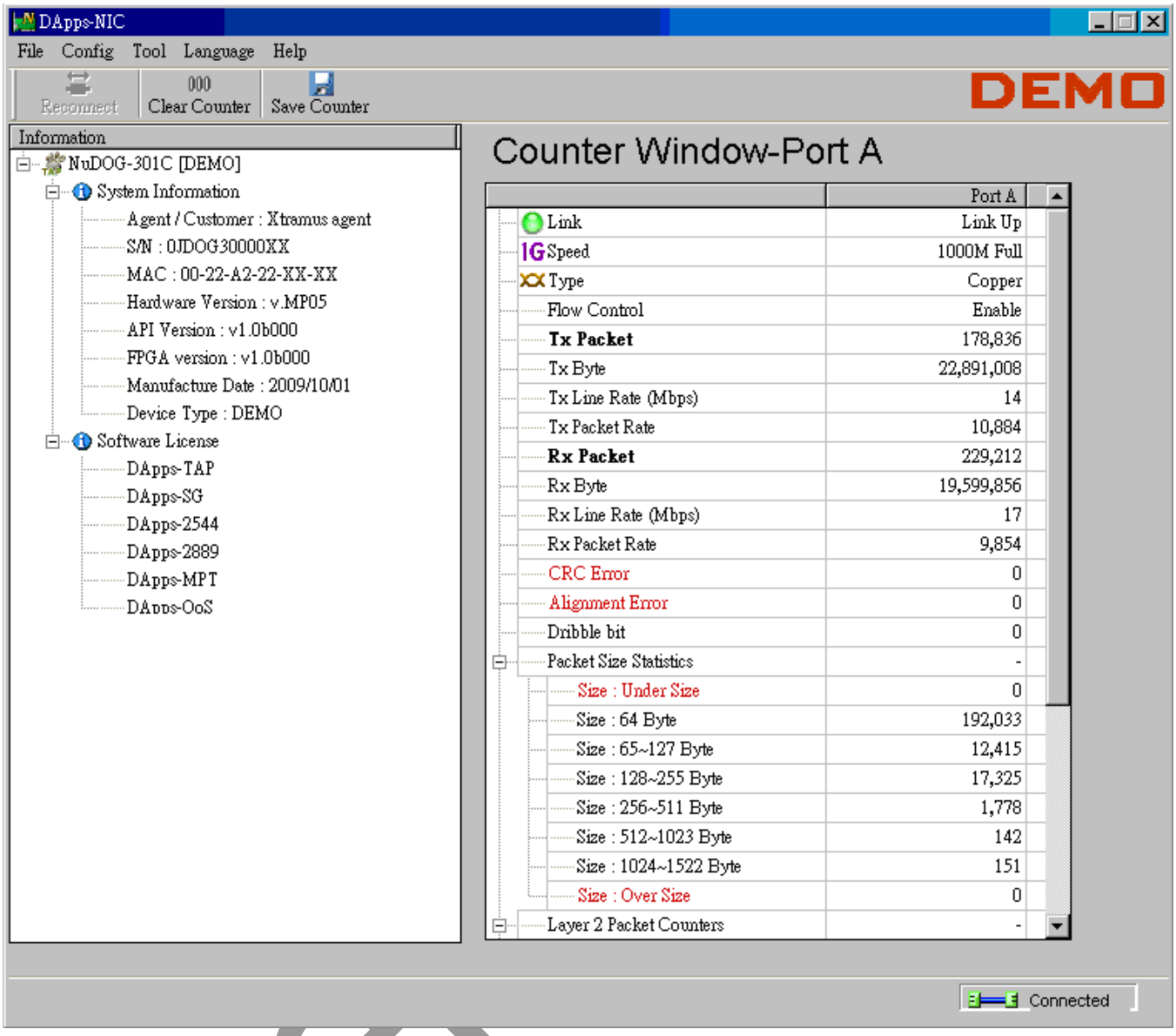
Before starting DApps-NIC, your PC and NuDOG-301C/NuDOG-801/NuDOG-101T shall be connected properly. The figure down below illustrates connecting PC and NuDOG-301C. You can connect NuDOG-801 and NuDOG-101T with PC in the same manner.



6.2. Starting DApps-NIC

Before starting DApps-NIC, the DUT, your PC, and NuDOG-301C/801/101T shall be connected as shown in "**6.1. Hardware Installation**".

You can start running DApps-NIC by:	
	➢ Click Start → Programs → NuStreams → DApps-NIC.
DApps-NIC v0.9b011	➢ Double-click DApps-NIC icon located on your PC's desktop.

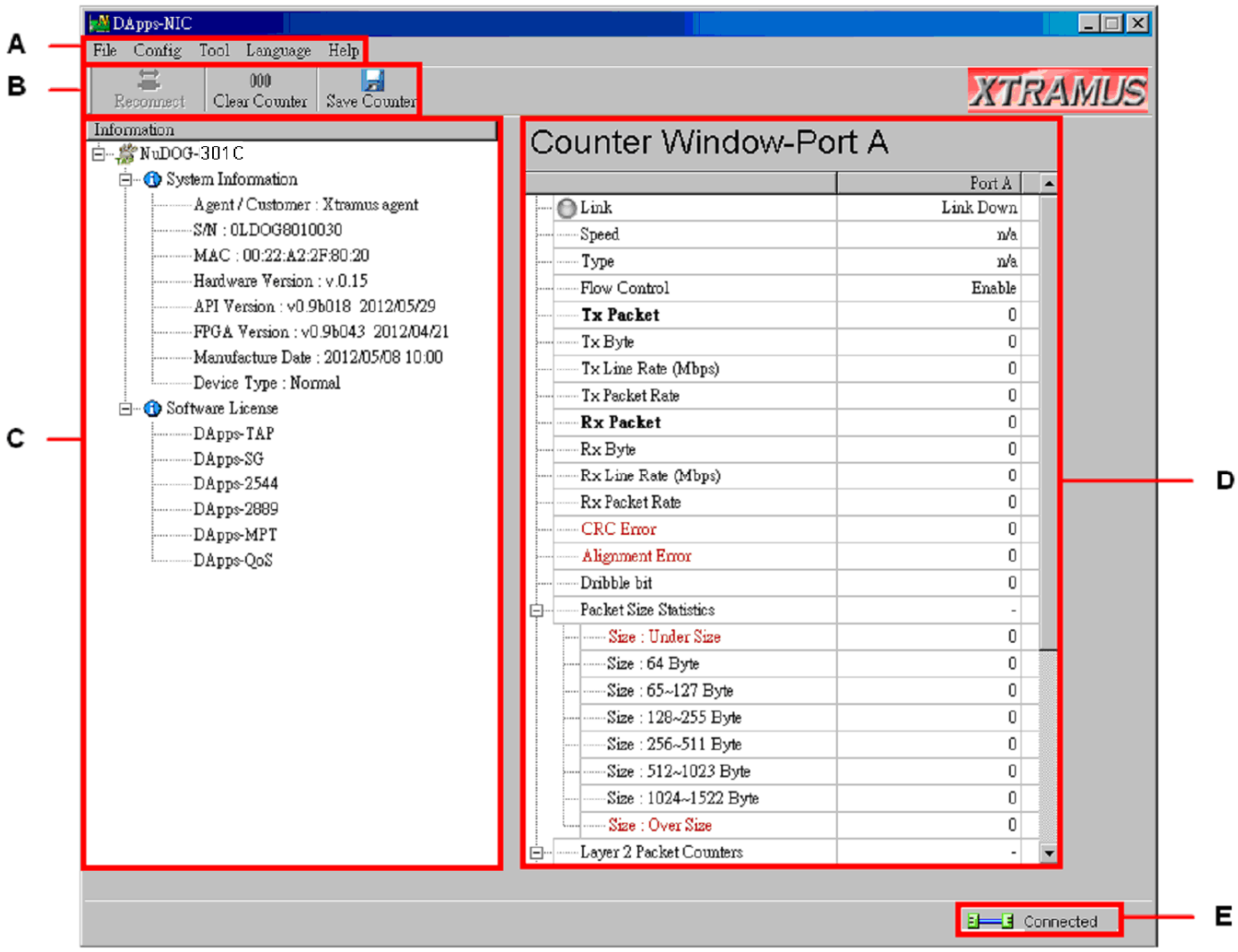


If your PC is not connected with NuDOG-301C/801/101T, you can still run DApps-NIC under Demo mode. Almost all DApps-NIC's functions are available under Demo Mode. However, please note that **Demo Mode is for system demo purposes only**, and does not serve any testing purposes at all.

Pre

6.3. DApps-NIC/NuServer Main Window Overview

DApps-NIC Main Window

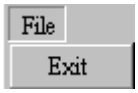


DApps-NIC Functions Overview		
A	**Menu Bar**	The **Menu Bar** allows you to switch between counter of port A or port B, to enable or disable flow control, to upgrade the FPGA and License of your NuDOG-301C/801/101T, change language displayed, view the version of the software/NuDOG-301C/801/101T and system requirement.
B	**Tool Bar**	The **Tool Bar** allows you to reconnect your PC to your NuDOG-301C/801/101T, clear counter window of port A or B and save the counter result.
C	**System Info/Software License**	From **System Info/Software License** you can view the system information and the Software License of your current connected NuDOG.
D	**Counter Window**	You can view real-time testing diagrams in here.
E	**System Connection Status**	This icon shows the connection status between your PC and NuDOG-301C/801/101T.

6.4. Menu Bar

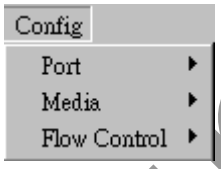
DApps-NIC Menu Bar includes configuration options such as **File**, **Config, Tool**, **Language**, and **Help**. Please refer to the sections down below for detail information regarding to each configuration option.

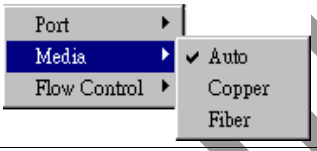
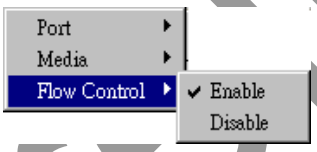
6.4.1. File



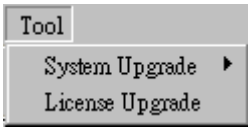
File	
Exit	A prompt pop-up window will ask if you are sure to exit DApps-NIC. Click **YES** to exit DApps-NIC, or click **NO** to cancel.

6.4.2. Config



Config		
Port		You can select Port A or Port B counter window to be displayed by clicking **Port** → **Port A** or **PortB**.
Media		You can select your current wire type by selecting between **Cooper** or **Fiber**, or you can select **Auto** for the system to auto detect your wire type.
Flow Control		You can select choose to **Enable** or **Disable** the Flow Control here.

6.4.3. Tool



Tool	
System Upgrade	Choosing the option **System Upgrade** → **FPGA upgrade** will allow you to upgrade the FPGA version of your NuDOG series. For more detail please refer to the **7.1. Upgrade FPGA.**
License Upgrade	Choosing the option **License Upgrade** will allow you to update your License if your NuDOG series is out of warranty. For more detail please refer to the **7.2. Upgrade License.**

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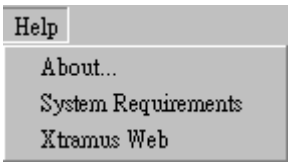
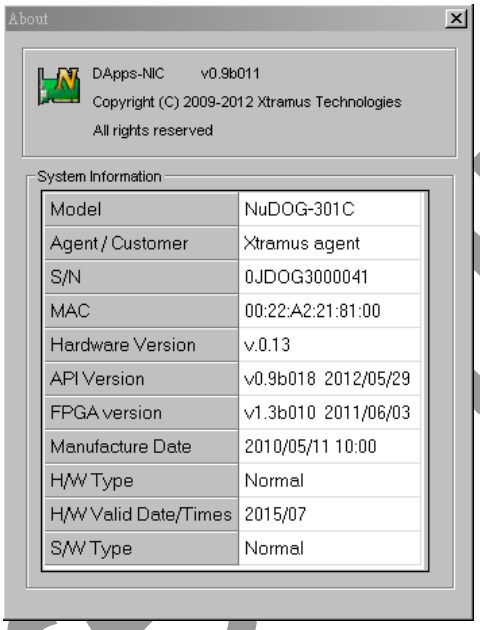
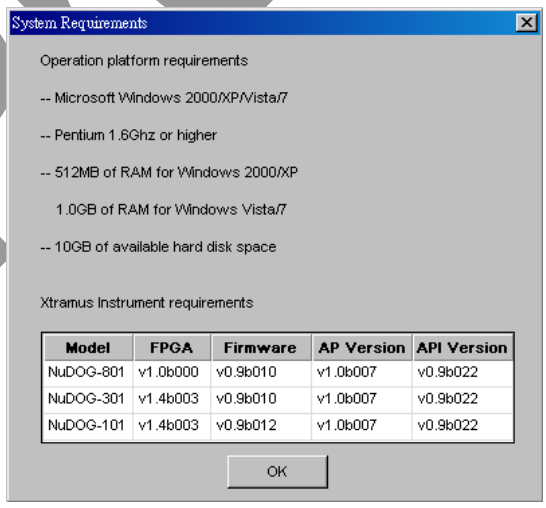
6.4.4. Language

Language	
English/ Japanese	DApps-NIC has **2** different languages for its UI available. You can set the language of UI to **English** or **Japanese**.

6.4.5. Help



Help		
About…		An "**About**" window will pop up and show detailed system information. Click the **OK** button to exit the "**About**" pop-up window.
System Requirements		A "**System Requirements**" window will pop up and show the requirements for your PC and the FPGA/Firmware of the module. Click the **OK** button to exit the "**System Requirements**" pop-up window.

System Requirements
Operation platform requirements
-- Microsoft Windows 2000/XP/Vista/7
-- Pentium 1.6Ghz or higher
-- 512MB of RAM for Windows 2000/XP
1.0GB of RAM for Windows Vista/7
-- 10GB of available hard disk space
Xtramus Instrument requirements
Model FPGA Firmware AP Version API Version
NuDOG-801 v1.0b000 v0.9b010 v1.0b007 v0.9b022
NuDOG-301 v1.4b003 v0.9b010 v1.0b007 v0.9b022
NuDOG-101 v1.4b003 v0.9b012 v1.0b007 v0.9b022
OK

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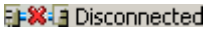
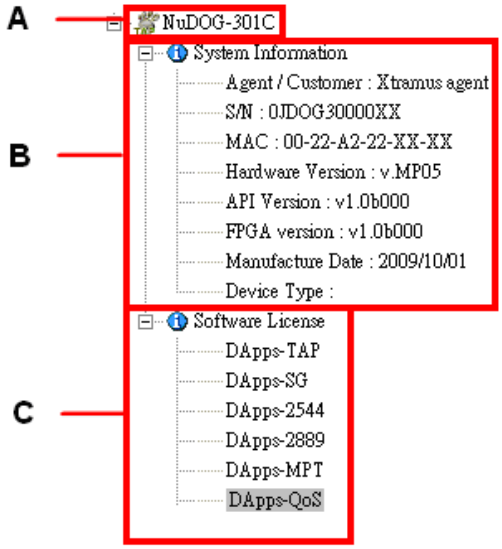
6.5. Tool Bar

The **Tool Bar** allows you to reconnect your PC to your NuDOG-301C/801/101T, clear counter window of port A or B and save the counter result.

Tool Bar	
	If the USB connection between your PC and NuDOG-301C/NuDOG-801/NuDOG-101T is down, a "**Disconnected**" icon  will be shown in "**System Connection Status**". Press **Reconnect** button to re-establish the connection between your PC and NuDOG-301C/NuDOG-801/NuDOG-101T. If the connection has been established successfully, a message window will pop up, and the "**System Connection Status**" will be shown as "**Connected**" .
	Click the **Clear Counter** button to refresh the **Counter Window-Port A** and **Counter Window-Port B**.
	Click the **Save Counter** button to save the current **Counter Window-Port A** and **Counter Window-Port B** results.

6.6. System Info/Software License



The **System Info/Configuration List** allows you to view system information, making port/test configurations, and check test reports on the **Main Display Screen**.

System Info/Software License	
A	Shows the current NuDOG model connected to your PC.
B	Shows the current information of the System
C	Click on the DApps software to pop up a window showing the license information regarding to other Xtramus softwares. For detail information of Software License, please refer to the **7.2. Upgrade License**.

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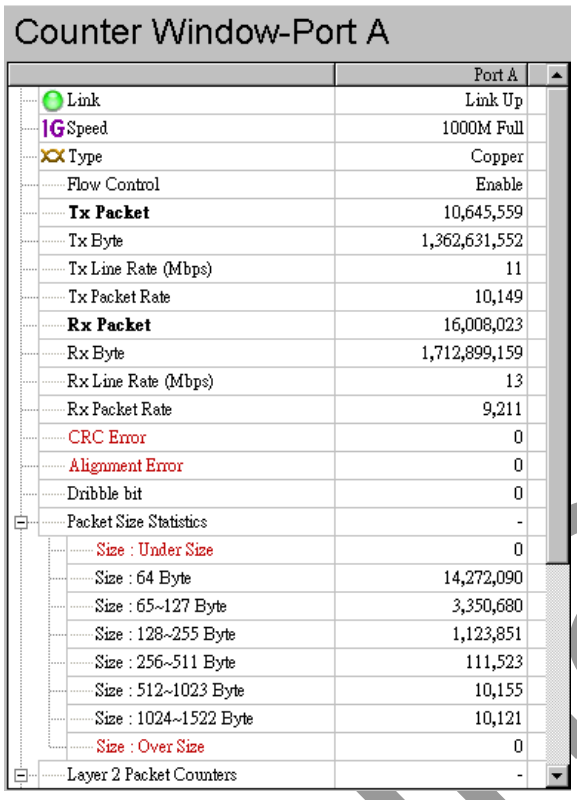
6.7. Counter Window



The Counter Window shows the status of the packets transmission of Port A and Port B of your NuDOG series, when it performs simulation of Network Interface Card (NIC).

For more details about simulation of Network Interface Card (NIC), please refer to the **8. Simulation of Network Interface Card (NIC)**.

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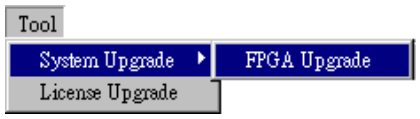
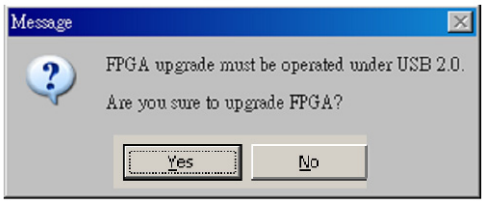
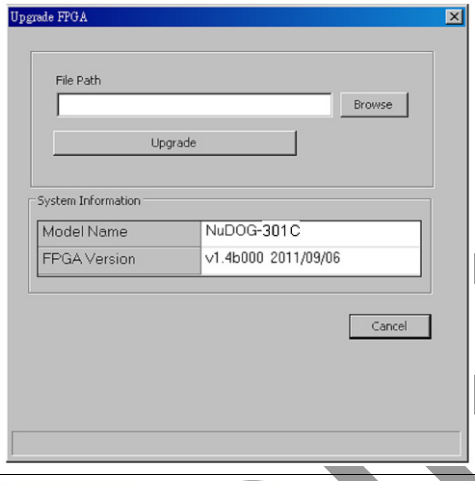
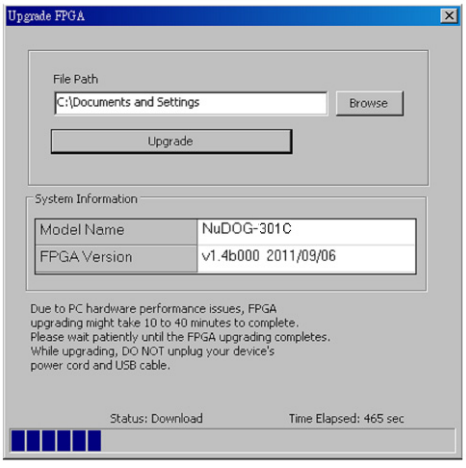
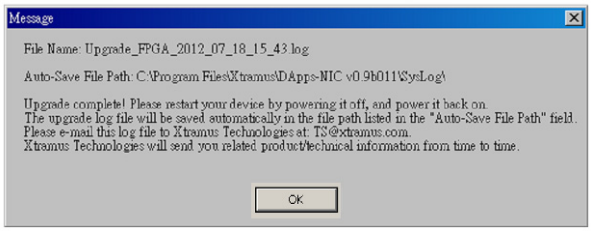
7. FPGA and License upgrade

You can upgrade the FPGA and License of your NuDOG series from DApps-NIC. Please connect your NuDOG series on your PC as shown on the figure of **6.1. Hardware Installation.**

7.1. Upgrade FPGA

Upgrading FPGA	
	1. Choose from the Menu Bar the option **Tool→System Upgrade → FPGA Upgrade.**
	2. A window will pop up to warn if your NuDOG series is connected or not with your PC. Click **Yes** for the next step.
	3. Another window will pop up. Please click the **Browse** button and select your FPGA upgrade file, than click **Upgrade** button to start the process. The System Information shows the current NuDOG model name and its FPGA version. You can cancel the upgrading process by clicking the **Cancel** button.
	4. Wait until the system completes the upgrading process. You can follow the upgrading process by referring to the progress bar down side of the window.
	5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated FPGA. To confirm if the FPGA version is installed, you can go to **Menu Bar → Help → About**.

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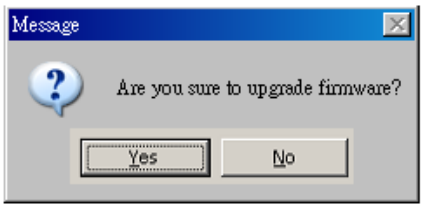
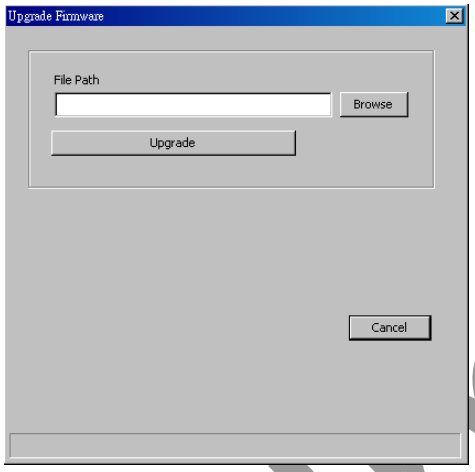
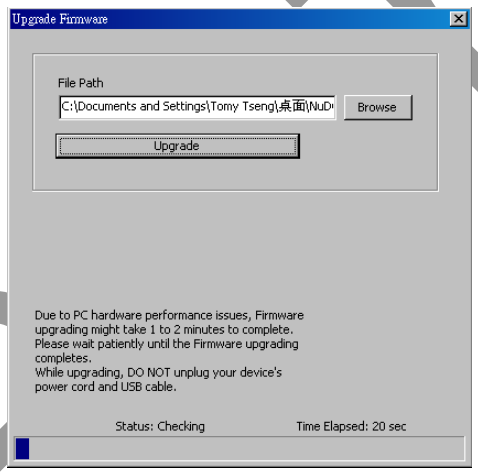
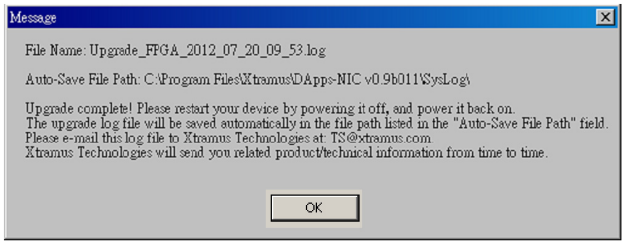
7.2. Upgrade Firmware (for NuDOG-801)

DApps-NIC provides NuDOG-801 the option for upgrading Firmware, please refer to the steps below:

Upgrading Firmware	
	1. Choose from the Menu Bar the option **Tool→System Upgrade → Firmware Upgrade.**
	2. A window will pop up to warn if your NuDOG series is connected or not with your PC. Click **Yes** for the next step.
	3. Another window will pop up. Please click the **Browse** button and select your Firmware upgrade file, than click **Upgrade** button to start the process. You can cancel the upgrading process by clicking the **Cancel** button.
	4. Wait until the system completes the upgrading process. You can follow the upgrading process by referring to the progress bar down side of the window.
	5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated Firmware. To confirm if the Firmware version is installed, you can go to **Menu Bar → Help → About**.

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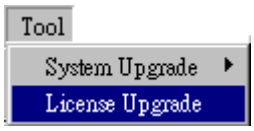
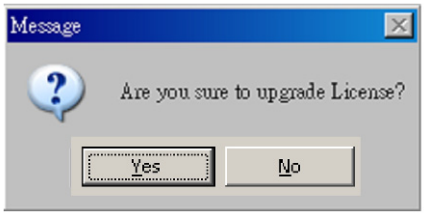
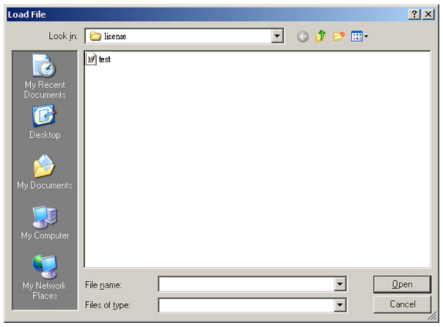
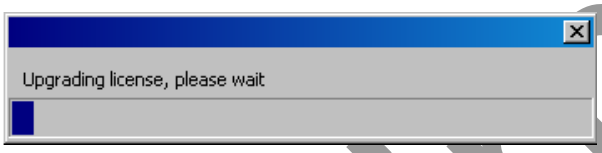
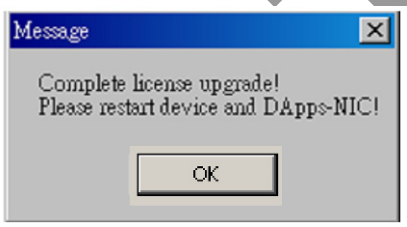
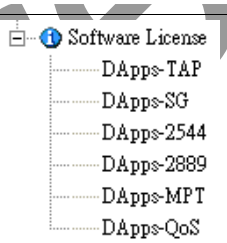
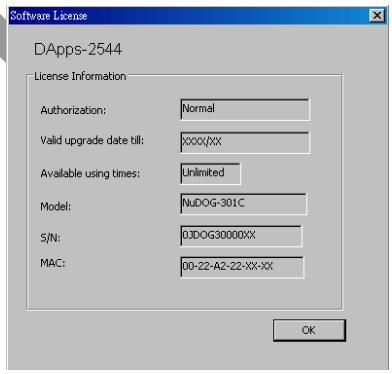
7.3. Upgrade License

Upgrade License	
	1. Choose from the Menu Bar the option **Tool→License Upgrade.**
	2. A window will pop up to warn if you are ready to upgrade your NuDOG series..Click **Yes** for the next step.
	3. Select the license upgrade file from next pop up window and click **Done**.
	4. A progress bar will pop up to show the status of the upgrade process.
	5. When the upgrading process is completed, a window will pop up advising you to reconnect your NuDOG to start the updated License.
 	6. You can confirm the license of other Xtramus softwares by clicking the software name on System Info/Software License. A Software License window will pop up showing the detail information of the selected software.

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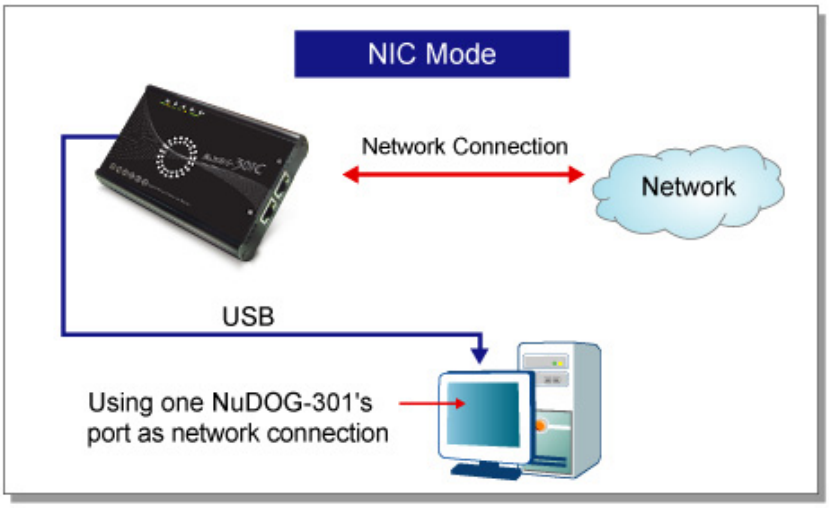
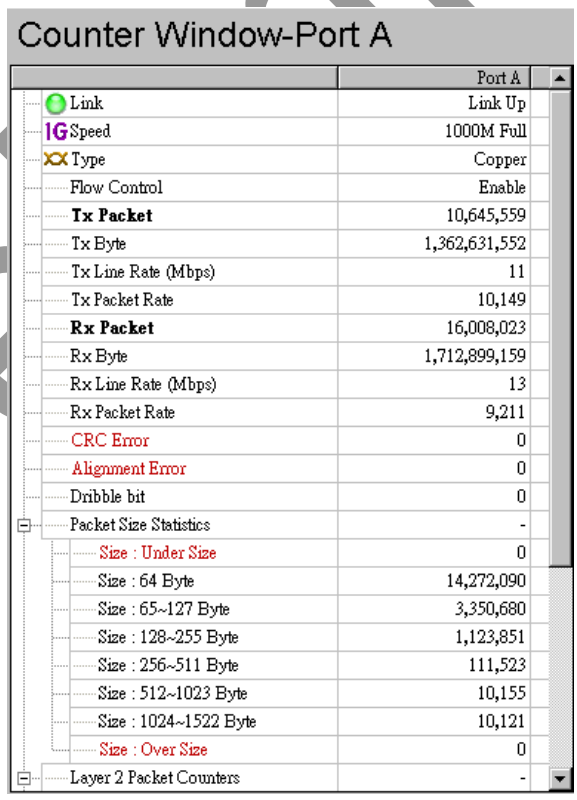
8. Simulation of Network Interface Card (NIC)

DApps-NIC is a software that allows NuDOG series to perform simulation of Network Interface Card (NIC). Please connect your NuDOG series on your PC as shown on the figure below:



Through DApps-NIC, the network traffic status is showed based on Tx/Rx, CRC error, alignment error, dribble bit, packet size statistics, layer 2 packet counters and network layer conditions, please refer to the figure below:



	Port A
Link	Link Up
Speed	1000M Full
Type	Copper
Flow Control	Enable
Tx Packet	10,645,559
Tx Byte	1,362,631,552
Tx Line Rate (Mbps)	11
Tx Packet Rate	10,149
Rx Packet	16,008,023
Rx Byte	1,712,899,159
Rx Line Rate (Mbps)	13
Rx Packet Rate	9,211
CRC Error	0
Alignment Error	0
Dribble bit	0
Packet Size Statistics	-
Size : Under Size	0
Size : 64 Byte	14,272,090
Size : 65~127 Byte	3,350,680
Size : 128~255 Byte	1,123,851
Size : 256~511 Byte	111,523
Size : 512~1023 Byte	10,155
Size : 1024~1522 Byte	10,121
Size : Over Size	0
Layer 2 Packet Counters	-

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9. Appendix – Other Utility Softwares for NuDOG series

There are several other optional utility softwares for NuDOG-301C/NuDOG-801/NuDOG-101T for different kinds of test requirements. The following section contains brief descriptions of these utility softwares.

DApps-TAP: Network TAP/Loopback Utility

For NuDOG-301C/NuDOG-801/NuDOG-101T, all data streams between two network ports can be duplicated and sent to PC via mini USB port for monitoring and analyzing. The user can specify conditions to filter the packets wanted with DApps-TAP application software. It reduces USB port's network traffic and also cuts down PC resource consumption while dealing with large quantity of packets.

DApps-SG: Control Suite for Multiple Streams Generator

DApps-SG provides a powerful and sophisticated virtual front control panel to manage this device. Two test ports can be configured independently with parameters to define multiple streams and capture capabilities. Traffic for various network protocols can be customized, transmitted, and received on each port. Comprehensive statistics give users an in-depth analysis of the DUT performance.

DApps-NIC: Network Interface Card Simulation Suite

NuDOG-301C has a mini-USB port for PC connection. In addition to network TAP, system control and system upgrade functions. NuDOG-301C/NuDOG-801/NuDOG-101T can also be used as a network interface card. With control software and NuDOG-301C/NuDOG-801/NuDOG-101T's hardware conversion, network data streams can flow between NuDOG-301C/NuDOG-801/NuDOG-101T's USB and network port.

DApps-2544: Test Suit Based on RFC 2544

DApps-2544 is a user-friendly and automatic test suite based on industry-standard RFC 2544. It generates and analyzes packets to evaluate the Throughput performances, Latency, Packet Loss, and Back-to-Back of Ethernet switches or routers via this device. The real-time test results display and customized report provide an effective way when examining the DUT.

DApps-2889: Test Suit Based on RFC-2889

DApps-2889 is a user-friendly and automatic test suite based on industry-standard RFC-2889 (partial) to test the DUT. RFC 2889 provides methodology for benchmarking for local area network (LAN) switching devices, forwarding performance, congestion control, latency, address handling and filtering. It extends the methodology already defined for benchmarking network interconnecting devices in RFC 2889.

DApps-MPT: Automatic batch tests for Ethernet device

DApps-MPT is an accurate and efficient software suite for mass-production scale test or batch network test. Various packet generation and reception testing items could be configured to pre-defined testing modes. The utility of DApps-MPT can load testing models easily. All simple and visualized results and detailed testing logs are available to access upon demand. DApps-MPT is a powerful and convenient tool to apply on this device.

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Doc # USM_DApps-NIC_V1.0_ENG_Preliminary_20120806